

Claims

- [c1] 1. A method for operating a high pressure gas storage system comprising the steps of:
- (a) opening a first valve on a first high pressure gas storage container;
 - (b) releasing gas from said first storage container;
 - (c) closing said first valve in response to a predetermined operating parameter;
 - (d) opening a second valve on a second high pressure gas storage container;
 - (e) releasing gas from said second storage container;
 - (f) closing said second valve in response to said predetermined operating parameter.
- [c2] 2. The method of operating a high pressure gas storage system of Claim 1 further comprising the step of:
- (a) repeating steps (d) through (f) for each container in the gas storage system.
- [c3] 3. The method of operating a high pressure gas storage system of Claim 2 further comprising the step of:
- (b) repeating steps (a) through (g) until the gas is depleted from the storage system.

- [c4] 4. The method of operating a high pressure gas storage system of Claim 3 wherein said operating parameter is a predetermined change in container gas pressure.
- [c5] 5. The method of operating a high pressure gas storage system of Claim 4 wherein said predetermined change in container gas pressure is between 10 and 100 psi.
- [c6] 6. The method of operating a high pressure gas storage system of Claim 5 wherein said predetermined change in container gas pressure is 50 psi.
- [c7] 7. The method of operating a high pressure gas storage system of Claim 6 wherein said operating parameter is a predetermined amount of time.
- [c8] 8. The method of operating a high pressure gas storage system of Claim 7 wherein said predetermined amount of time is between 15 and 30 minutes.
- [c9] 9. The method of operating a high pressure gas storage system of Claim 8 wherein said predetermined amount of time is 20 minutes.
- [c10] 10. A high pressure gas storage system comprising:
a plurality of storage tank groups fluidly coupled to each other,
each of said plurality of storage tank groups having

at least a first and second gas storage container fluidly coupled together and a valve fluidly coupled to said first and second storage container wherein when said valve is closed, said first and second gas containers are fluidly isolated from said other storage tank groups.

- [c11] 11. The high pressure gas storage system of claim 10 wherein said plurality of storage tank groups is fluidly connected to a pressure regulator by a first conduit.
- [c12] 12. The high pressure gas storage system of claim 11 further comprising a pressure transducer coupled to said first conduit between said pressure regulator and said plurality of storage tank groups.
- [c13] 13. The high pressure gas storage system of claim 12 further comprising a first pressure relief valve fluidly coupled between a vent and said plurality of storage tank groups.
- [c14] 14. The high pressure gas storage system of claim 13 further comprising
 - a shut off valve fluidly coupled to said pressure regulator by a second conduit; and,
 - a pressure vent valve fluidly coupled to said vent and said second conduit between said pressure regulator

and said shut off valve.

- [c15] 15. The high pressure gas storage system of claim 14 further comprising a second pressure transducer coupled to said second conduit.
- [c16] 16. The high pressure gas storage system of claim 15 further comprising an input valve fluidly coupled to said first conduit.
- [c17] 17. The high pressure gas storage system of claim 16 further comprising a third pressure transducer coupled to said input valve opposite said third conduit.
- [c18] 18. The high pressure gas storage system of claim 17 further comprising a second pressure relief valve coupled to said shut off valve and said vent.
- [c19] 19. The high pressure gas storage system of claim 18 further comprising a pressure switch fluidly coupled to said shut off valve and said second pressure relief valve.
- [c20] 20. A method for determining the individual pressure level of a gas storage container in a gas pressure storage system, when it is coupled to a plurality of gas storage containers utilizing a single pressure transducer, said method comprising the steps of:
 - (a) closing the valves to all gas storage containers;

- (b) opening the valve to a first gas storage container to allow gas to enter a first conduit;
- (c) measuring the gas pressure in said first conduit;
- (d) losing the valve to said first storage container;
- (e) opening a valve to vent said gas from said conduit;
- (f) closing the valve to said vent.

[c21] 21. The method for determining pressure of claim 20 further comprising the step of:

- (g) repeating steps (b) through (f) for each container in said system.

[c22] 22. A method for determining the health of a valve which conducts gas in a high pressure gas storage system, said method comprising the steps of:

- (a) closing all tank valves in the system;
- (b) venting gas from a conduit connected to said tank valves, said conduit being fluidly coupled to the check valve;
- (c) closing a valve to said vent;
- (d) opening at least one tank valve to pressurize said conduit;
- (e) closing said tank valve; and,
- (f) opening an input valve, said input valve being fluidly coupled to the valve opposite said conduit.

- [c23] 23. The method of determining the health of a valve of claim 22 further comprising the steps of:
- (g) measuring a first gas pressure at said input valve;
 - (h) waiting a predetermined amount of time;
 - (i) measuring a second gas pressure after said predetermined amount of time; and,
 - (j) disabling said system if the difference between said first gas pressure and said second gas pressure exceeds a predetermined amount.
- [c24] 24. The method of determining the health of a valve of claim 23 wherein the pressure transducer is positioned within a fuel cell.
- [c25] 25. The method of determining the health of a valve of claim 22 wherein said predetermined pressure amount is 15 psi.
- [c26] 26. A method for determining the health of a first and second pressure transducer where each pressure transducer is located on either side of a pressure regulator, said method comprising the steps of:
- (a) measuring a first pressure of gas at a first pressure transducer;
 - (b) measuring a second pressure of gas at a second pressure transducer, where said second pressure transducer is located downstream from said first

pressure transducer and opposite a pressure regulator;

(c) comparing said first pressure with said second pressure once the pressure at said first pressure transducer drops below a predetermined threshold; and,

(d) creating a signal if the difference between said first pressure and said second pressure is greater than a predetermined amount.

[c27] 27. The method for determining the health of a first and second pressure transducer of claim 26 wherein said predetermined threshold is the lower control pressure of the pressure regulator.

[c28] 28. The method for determining the health of a first and second pressure transducer of claim 27 wherein said predetermined threshold is 50 psi.

[c29] 29. A method for determining the health of a pressure transducer while filling a gas storage system comprising the steps of:

(a) generating gas at a pressure;

(b) measuring a first gas pressure at a first pressure transducer;

(c) measuring a second gas pressure at a second pressure transducer; and,

(d) creating a signal if the difference between said first and second gas pressure is greater than a pre-determined threshold.